

Remarks

Claims 4, 5, 9 - 13, and 16 - 24 are pending. Claims 1 - 3, 6 - 8, 14 and 15 have been cancelled. Favorable reconsideration is respectfully requested.

The present invention is directed to filter devices which remove or inactivate pathogens from air streams. The air streams of particular interest are those exiting areas where pathogen growth takes place, or where pathogens may be expected, i.e. in biohazard operating rooms, glove boxes where experiments with pathogens take place, etc. Filtration occurs in a porous metal foam or sintered metal filter element, and to inactivate the pathogens, both those trapped within the filter as well as those which pass through, the filter is resistively heated by passing an electric current through the metal filter. It is important that the temperature of the filter be relatively uniform across its cross-section, as otherwise, pathogens which traverse a cooler section of the filter may pass through and still be viable.

Applicants have found that by providing filter elements with a thickness such that the flux of electric current through the filter cross-section is substantially constant, substantially constant heating also occurs. This situation may be illustrated with respect to Figure 5, wherein the disk-like filter elements thickness is tapered from a high thickness along the inner periphery where the element is attached to the central electrode 36 to a lower thickness around the outer periphery which is attached to the other electrode. The electrical flux is substantially constant in a radial direction, and the temperature of each element will be quite uniform over the entire disk surface.

Claim 1 has been cancelled and rewritten as new claim 17, incorporating all the limitations of claim 1 as well as the limitations just discussed. None of the prior art teaches or suggests this subject matter, and thus claim 17 and all claims dependent thereon should be allowable. Closest prior art to this aspect of the invention, according to the Office, is Bolt et al. U.S. 5,557,923 ("*Bolt*"). However, Figure 2 of *Bolt* does not show such an arrangement. The *Bolt* filter element (5a) appears to have the same thickness, whether adjacent to first

electrode 5b (left side) or second electrode (5b) (right side), yet the cross-sectional area adjacent right electrode 5b is much less (about $\frac{1}{4}$) the cross-sectional area at leftmost electrode 56. Thus, the narrower the conical section, the more it will be heated. The cylindrical portions of filter element 5a which are adjacent the leftmost electrode 5b will have a much lower temperature than those adjacent rightmost electrode 5b. Of course, the filter elements of *Bolt* are also not facing the inlet airstream, but are parallel or substantially parallel to this stream.

Claims 11 - 13, 23 and 24 are dependent directly or indirectly on claim 17 and should be allowable.

Claims 9 and 10 have been rewritten as independent claims. Claim 10 was indicated as objected to but otherwise allowable, and should now, as an independent claim, be allowable. Claim 9 was rejected over *Bolt*. Claim 9 requires the filter element to have an increased thickness at a second electrode relative to a first electrode. The Office refers to *Bolt* Figure 2, discussed above. However, while the filter element diameter in Figure 2 is greater at one electrode of *Bolt* than the second electrode, the thickness of the element is the same at both electrodes. *Bolt* does not teach or suggest the subject matter of claim 9, and thus claim 9 should be allowable. Applicants note also that claim 9 has been amended to overcome the rejection of this claim under 35 U.S.C. § 112.

Applicants submit that the claims are now in condition for Allowance, and respectfully request a Notice to that effect. If the Examiner believes that further discussion will advance the prosecution of the Application, the Examiner is highly encouraged to telephone Applicants' attorney at the number given below.

Respectfully submitted,

Albert J. Shih

By 

William G. Conger

Reg. No. 31,209

Attorney/Agent for Applicant

Date: December 1, 2005

BROOKS KUSHMAN P.C.
1000 Town Center, 22nd Floor
Southfield, MI 48075-1238
Phone: 248-358-4400
Fax: 248-358-3351